Effects of Promethazine on Human Performance, Mood States, and Motion Sickness Tolerance

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Abstract: Intramuscular (IM) injections of promethazine in 25 mg or 50 mg dosages are commonly used to treat space motion sickness in astronauts. The present study examined the effects of IM injections of promethazine on neuropsy-chological performance, mood states, and motion sickness tolerance in humans. Twelve men, mean age 36 plus or minus 3.1 participated in one training (no injections) and three treatment conditions: a 25 mg injection of promethazine, a 50 mg injection of promethazine, and a placebo injection of sterile saline. Each condition, spaced at 7 day intervals, required an 8-10 hr session in which subjects were given four repetitions of 12 performance tasks, and one rotating chair motion sickness test. On the training day subjects were trained on each task to establish stability and proficiency. On treatment days, the order in which the drug or placebo was assigned to subjects was counter-balanced and a double-blind technique was used. Statistically significant decrements in performance were observed on 10 of 12 tasks when subjects were given 25 mg or 50 mg of promethazine as compared to the placebo. Performance decrements were associated with mean blood alcohol dose equivalency levels of 0.085% for 25 mg and 0. 1 37% for 50 mg dosages. The mood scale results showed significant changes in individual subjective experiences with maximum deterioration in the arousal state and fatigue level. When compared to placebo significant increases in motion sickness tolerance were found for both dosages of promethazine. These data suggest that effective dosages of promethazine currently used to counteract motion sickness in astronauts may significantly impair task components of their operational performance.